US009055203B2

(12) **United States Patent**
Harigae

(10) **Patent No.: US 9,055,203 B2**
(45) **Date of Patent: Jun. 9, 2015**

(54) **IMAGE FORMING APPARATUS AND STORAGE METHOD OF PRINT DATA**

(71) Applicants: **KABUSHIKI KAISHA TOSHIBA**, Minato-ku, Tokyo (JP); **TOSHIBA TEC KABUSHIKI KAISHA**, Shinagawa-ku, Tokyo (JP)

(72) Inventor: **Makoto Harigae**, Tokyo-to (JP)

(73) Assignees: **Kabushiki Kaisha Toshiba**, Tokyo (JP); **Toshiba Tec Kabushiki Kaisha**, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/078,915**

(22) Filed: **Nov. 13, 2013**

(65) **Prior Publication Data**

US 2015/0131120 A1 May 14, 2015

(51) **Int. Cl.**

G06K 15/02	(2006.01)
H04N 1/21	(2006.01)
H04N 1/00	(2006.01)
H04N 1/44	(2006.01)

(52) **U.S. Cl.**

CPC ***H04N 1/21*** (2013.01); ***H04N 1/00209*** (2013.01); ***H04N 1/00347*** (2013.01); ***H04N 1/00477*** (2013.01); ***H04N 1/00408*** (2013.01); ***H04N 1/4433*** (2013.01); *H04N 2201/0094* (2013.01); *H04N 2201/214* (2013.01); *H04N 2201/218* (2013.01)

(58) **Field of Classification Search**

USPC 358/1.15

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2009/0002733	A1*	1/2009	Kakigi	358/1.9
2011/0273738	A1*	11/2011	Tanaka et al.	358/1.14
2014/0211236	A1*	7/2014	Kasuga et al.	358/1.14

* cited by examiner

Primary Examiner — Qian Yang

(74) *Attorney, Agent, or Firm* — Amin, Turocy & Watson, LLP

(57) **ABSTRACT**

Generally, in accordance with one embodiment, an image forming apparatus comprises a communication section, a storage section, an operation section, an image forming section, and a controller. The communication section receives print data. The storage section stores print data in a print data area. The operation section receives an operation input. The image forming section forms, if the operation section receives a printing instruction of print data, an image on a sheet based on the print data. The controller moves the print data which are not printed even a given period has passed since the print data is received by the communication section from a print data area to other storage area.

7 Claims, 5 Drawing Sheets

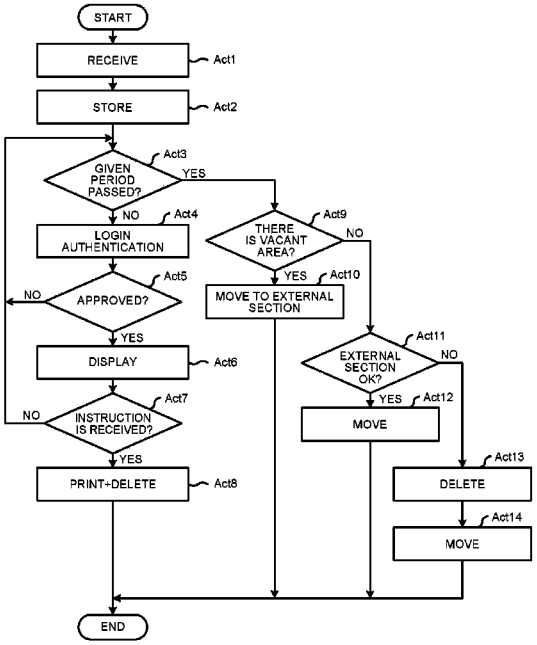

FIG.1

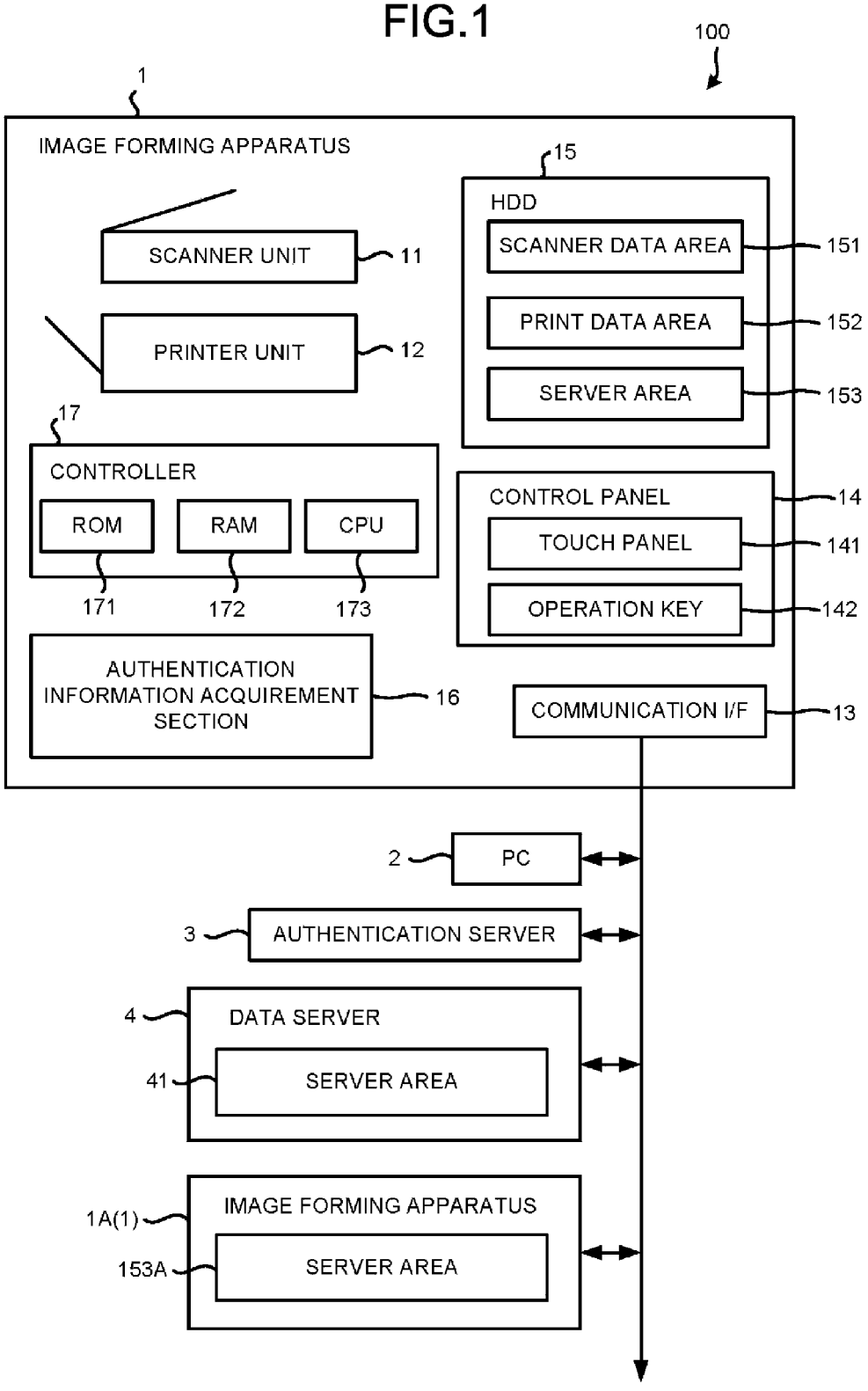
100
1
IMAGE FORMING APPARATUS
15
HDD
SCANNER DATA AREA
151
PRINT DATA AREA
152
SERVER AREA
153
SCANNER UNIT
11
PRINTER UNIT
12
17
CONTROLLER
ROM
RAM
CPU
171
172
173
CONTROL PANEL
14
TOUCH PANEL
141
OPERATION KEY
142
AUTHENTICATION INFORMATION ACQUIREMENT SECTION
16
COMMUNICATION I/F
13
2
PC
3
AUTHENTICATION SERVER
4
DATA SERVER
41
SERVER AREA
1A(1)
IMAGE FORMING APPARATUS
153A
SERVER AREA

FIG.2

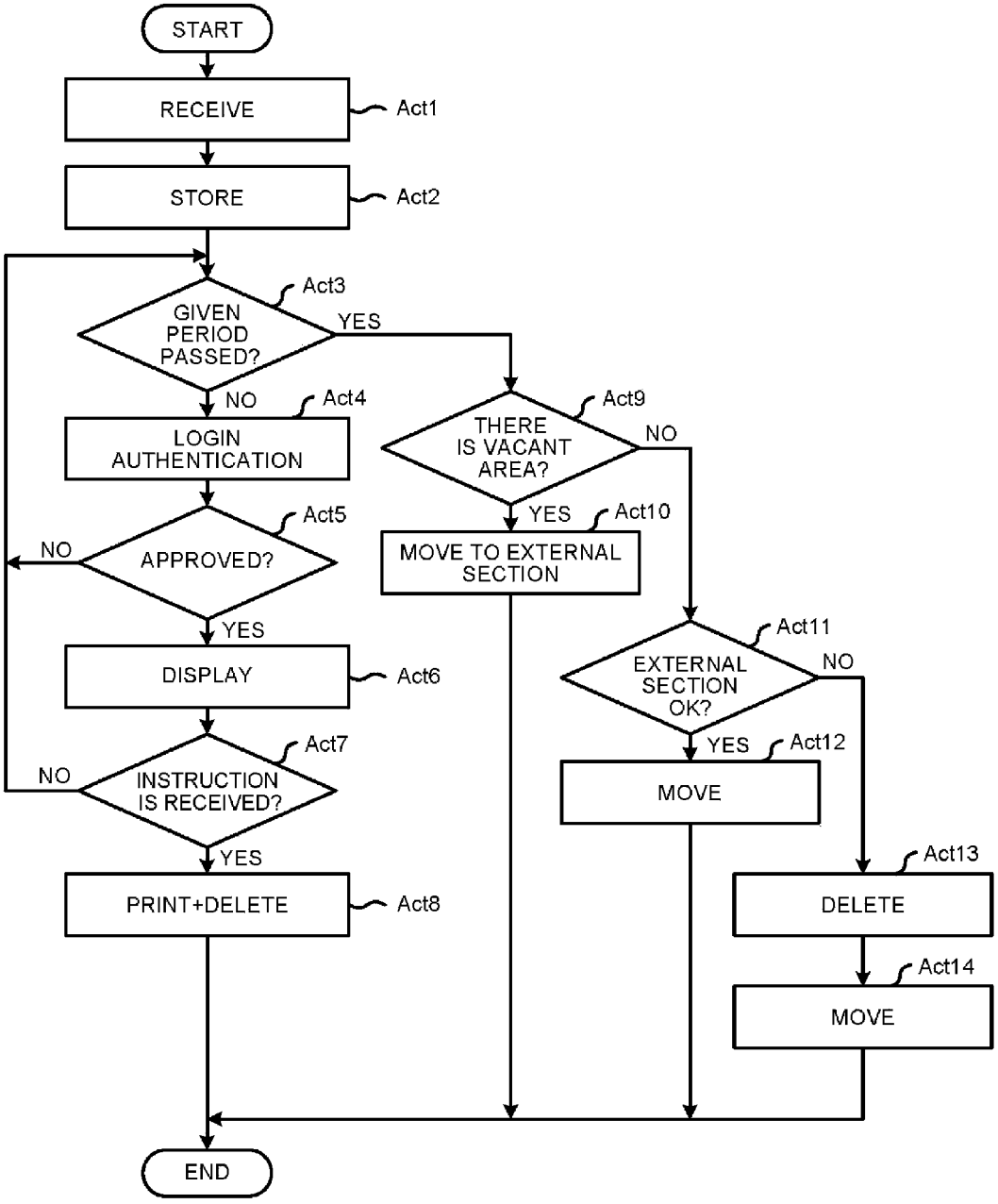
START
RECEIVE
Act1
STORE
Act2
Act3
GIVEN PERIOD PASSED?
YES
NO
Act4
LOGIN AUTHENTICATION
Act5
APPROVED?
NO
YES
DISPLAY
Act6
Act7
INSTRUCTION IS RECEIVED?
NO
YES
PRINT+DELETE
Act8
Act9
THERE IS VACANT AREA?
NO
YES
Act10
MOVE TO EXTERNAL SECTION
Act11
EXTERNAL SECTION OK?
NO
YES
Act12
MOVE
Act13
DELETE
Act14
MOVE
END

FIG.3

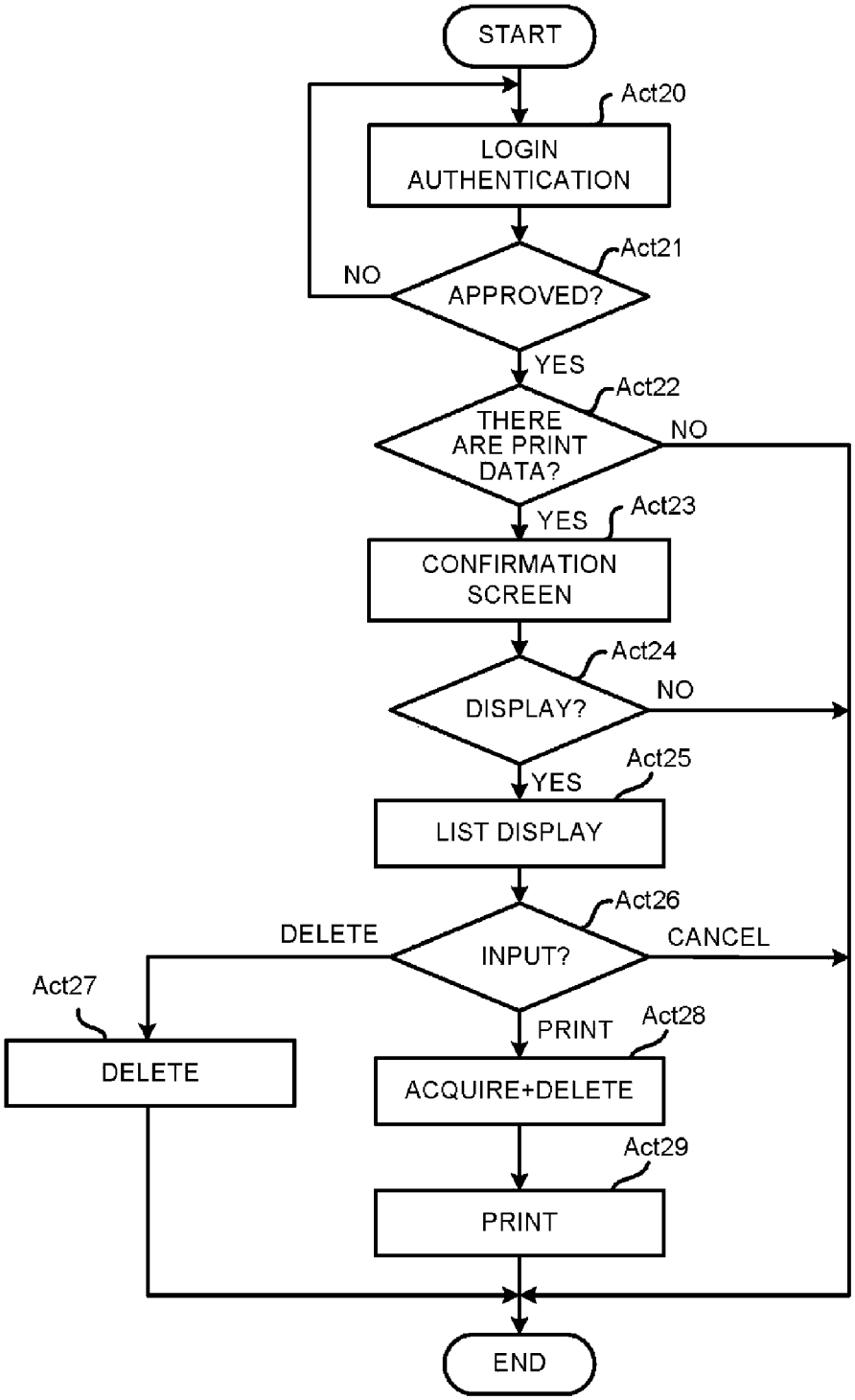
START
Act20
LOGIN AUTHENTICATION
Act21
NO
APPROVED?
YES
Act22
THERE ARE PRINT DATA?
NO
YES
Act23
CONFIRMATION SCREEN
Act24
DISPLAY?
NO
YES
Act25
LIST DISPLAY
Act26
DELETE
INPUT?
CANCEL
Act27
PRINT
Act28
DELETE
ACQUIRE+DELETE
Act29
PRINT
END

FIG.4

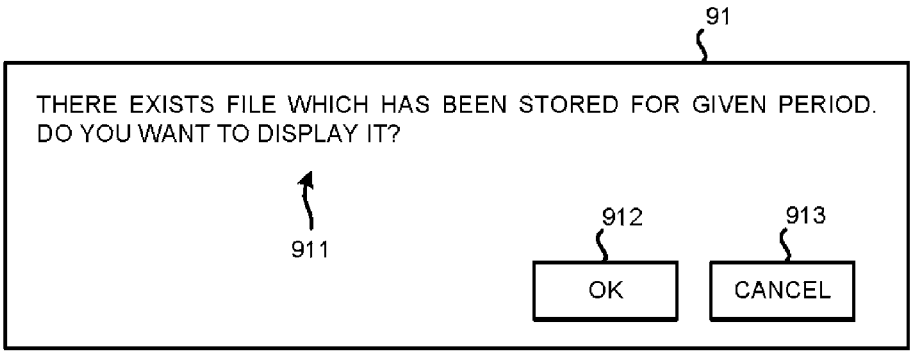
91
THERE EXISTS FILE WHICH HAS BEEN STORED FOR GIVEN PERIOD.
DO YOU WANT TO DISPLAY IT?
911
912
913
OK
CANCEL

FIG.5

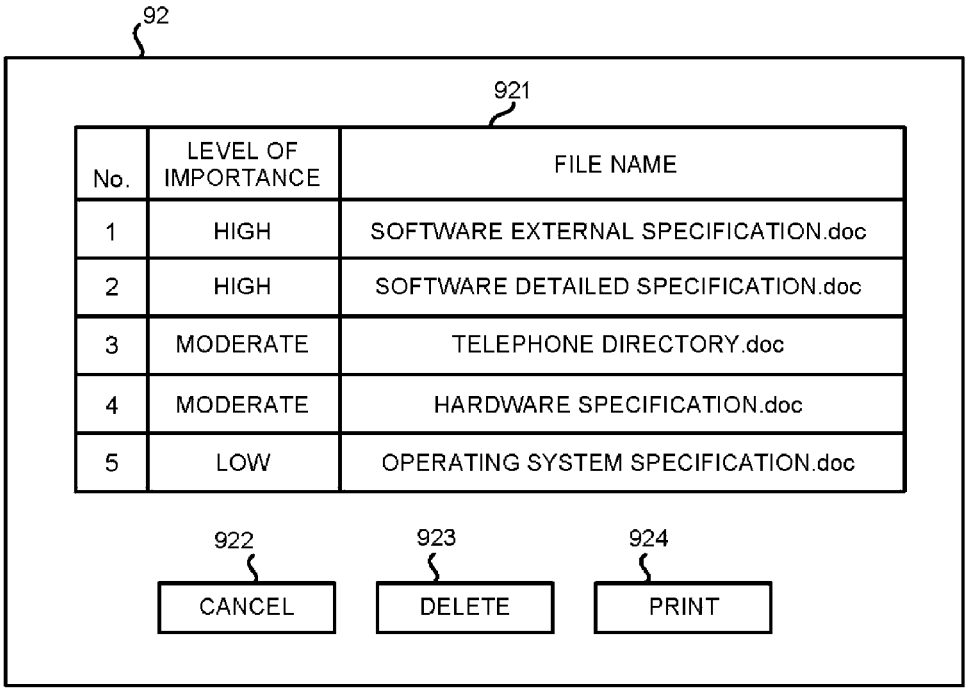
92
921
No.
LEVEL OF IMPORTANCE
FILE NAME
1
HIGH
SOFTWARE EXTERNAL SPECIFICATION.doc
2
HIGH
SOFTWARE DETAILED SPECIFICATION.doc
3
MODERATE
TELEPHONE DIRECTORY.doc
4
MODERATE
HARDWARE SPECIFICATION.doc
5
LOW
OPERATING SYSTEM SPECIFICATION.doc
922
CANCEL
923
DELETE
924
PRINT

IMAGE FORMING APPARATUS AND STORAGE METHOD OF PRINT DATA

FIELD

Embodiments described herein relate to a storage technology of print data.

BACKGROUND

When printing print data in an image forming apparatus, a user sends print data from a PC (Personal Computer) to an image forming apparatus, then goes to the apparatus serving as the sending destination to print the print data. The image forming apparatus stores the print data if the print data is received from the PC. The image forming apparatus carries out a printing operation if a printing instruction is received from the user, and then deletes the print data.

Conventionally, the image forming apparatus deletes the print data which are not printed in a given period in the stored print data.

However, there exists a case where a user sends print data to the image forming apparatus but forgets to print the print data. In this case, if the print data are deleted from the PC, a problem exists that the user cannot print the print data.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a printing system;

FIG. **2** is a flowchart illustrating a storage processing of print data in a case where a user prints the print data in a given period after sending the print data to an image forming apparatus;

FIG. **3** is a flowchart illustrating a storage processing of print data in a case where there are moved print data when a user logs in;

FIG. **4** is a diagram illustrating a confirmation screen; and

FIG. **5** is a diagram illustrating a management screen.

DETAILED DESCRIPTION

Generally, in accordance with one embodiment, an image forming apparatus comprises a communication section, a storage section, an operation section, an image forming section, and a controller. The communication section receives print data. The storage section stores print data in a print data area. The operation section receives an operation input. The image forming section forms an image on a sheet based on the print data if the operation section receives a printing instruction of the print data. The controller moves the print data which are not printed even a given period has passed since the print data is received by the communication section from a print data area to other storage area.

Generally, in accordance with one embodiment, a storage method of print data based on an image forming apparatus which is provided with a storage section for storing print data in a print data area and an operation section for receiving an operation input includes receiving print data; forming an image on a sheet based on the print data if the operation section receives a printing instruction of the print data; moving the print data which are not printed even a given period has passed since the print data is received from a print data area to other storage area.

Hereinafter, embodiments are described with reference to accompanying drawings.

FIG. **1** is a block diagram of a printing system **100**.

The printing system **100** comprises a plurality of image forming apparatuses **1**, a PC **2**, an authentication server **3** and a data server **4**. Hereinafter, in order to distinguish the image forming apparatus serving as a sending destination of the print data from a user and the image forming apparatus different from the image forming apparatus serving as a sending destination, the image forming apparatus serving as a sending destination is represented by **1**, and the image forming apparatus different from the image forming apparatus serving as a sending destination is represented by **1**A.

The image forming apparatus **1** is a MFP (Multi Function Peripheral) having a plurality of functions such as a scanning function and a printing function. The image forming apparatus **1** comprises a scanner unit **11**, a printer unit **12** (image forming section), a communication I/F **13** (Interface: communication section), a control panel **14**, an HDD **15** (Hard Disk Drive: storage section), an authentication information acquirement section **16** and a controller **17**.

The scanner unit **11** reads an original and stores image data in the HDD **15**.

The printer unit **12** forms an image on a sheet based on the image data read by the scanner unit **11** or the print data received from a PC **2**.

The communication I/F **13** is used for the controller to carry out data communication with external apparatuses **2**-**4** such as the PC **2**.

The control panel **14** comprises a touch panel **141** (display and operation section) and an operation key **142** (operation section). The control panel **14** displays setting information of the image forming apparatus **1** and an operation status, log information, and a notification to a user on the touch panel **141**. Further, the control panel **14** receives an operation input from a user, and receives an instruction of function operation of the image forming apparatus **1** such as a printing instruction using the touch panel **141** and the operation key **142**.

The HDD **15** comprises a scanner data area **151**, a print data area **152** and a server area **153**. The scanner data area **151** temporarily stores the image data read by the scanner unit **11**. The print data area **152** temporarily stores the print data received from the PC **2**. The controller **17** deletes the image data and the print data in each area **151**, **152** from the areas **151**, **152** if a job using the image data and the print data in each area **151**, **152** is executed.

The storage capacity of the scanner data area **151** is set to be different from that of the print data area **152**, for example, the scanner data area **151** is set to be 100 MB, and the print data area **152** is set to be 50 MB.

The server area **153** can be used as a file server.

The authentication information acquirement section **16** is a card reader for acquiring the authentication information of a user from a card if the card such as a member identification card from the user is put in front of the authentication information acquirement section **16**.

The controller **17** comprises a ROM **171** (Read Only Memory), a RAM **172** (Random Access Memory) and a CPU **173** (Central Processing Unit). The ROM **171** stores various control programs. The RAM **172** provides a temporary work area to the CPU **173**. The CPU **173** realizes various functions by executing the programs stored in the ROM **171** and the RAM **172**.

The controller **17** controls the whole image forming apparatus **1**. The controller **17** discloses the server area **153** as a data server, and makes the server area **153** accessible to a data server **4** connected with the image forming apparatus **1** through a network and other image forming apparatus **1**A.

Other image forming apparatus **1**A also has the same constitution as the image forming apparatus **1**, and comprises a server area **153**A accessible to the image forming apparatus **1** and the data server **4**.

The PC **2** sends the print data to the image forming apparatus **1** according to an operation from a user who carried out a login authentication.

The authentication server **3** receives authentication information from the image forming apparatus **1** and the PC **2**, determines whether or not the authentication is proper, and sends back the determination to the image forming apparatus **1** and the PC **2**.

The data server **4** comprises a server area **41** accessible to the image forming apparatus **1** and **1**A, and stores data in the server area **41**.

Hereinafter, the storage processing of the print data based on the image forming apparatus **1** in a case where a user prints the print data in a given period after sending the print data to the image forming apparatus **1** is described with reference to a flowchart in FIG. **2**.

The controller **17** of the image forming apparatus **1** receives print data and identification information of a user from the PC **2** which approves logging in of the user (ACT **1**).

The controller **17** stores the received print data in the print data area **152** of the HDD **15** in association with the identification information of the user (ACT **2**).

The controller **17** determines whether or not a given period has passed since the print data of the print data area **152** is received (ACT **3**).

The controller **17** leaves the print data stored in the print data area **152** if the given period has not passed since the print data is received (NO in ACT **3**).

The user, if desiring to print, goes to the image forming apparatus **1** serving as the sending destination of the print data, and prints the print data after receiving the login authentication of the image forming apparatus **1**.

The controller **17** acquires the authentication information of the user and carries out login authentication (ACT **4**). Specifically, the controller **17** acquires the authentication information of the user from the card of the user put in front of the authentication information acquirement section **16**, or acquires the authentication information such as an ID and a pass word through the control panel **14**. The controller **17** outputs the authentication information to the authentication server **3**, and approves the logging in of the user if receiving a proper response (YES in ACT **5**).

The controller **17** displays a list of the print data in the print data area **152** associated with the identification information of the user according to the operation input received by the control panel **14** (ACT **6**). If receiving a selection of print data and a printing instruction of the print data (YES in ACT **7**), the controller **17** carries out a printing operation based on the print data desired to be printed, and then deletes the print data from the print data area **152** (ACT **8**).

If the print data are not printed even the given period has passed since the print data is received (YES in ACT **3**), and if there is vacant area in the server area **153** (YES in ACT **9**), the controller **17** moves the print data which are not printed even the given period has passed from the print data area **152** to the server area **153** (ACT **10**).

If there is no vacant area in the server area **153** (NO in ACT **9**), the controller **17** checks whether or not there is vacant area in the server areas **41**, **153**A of the data server **4** and other image forming apparatus **1**A (ACT **11**).

If there is vacant area in other server areas **41**, **153**A (YES in ACT **11**), the controller **17** moves the print data which are not printed even the given period has passed to the server areas **41**, **153**A in which vacant area exists (ACT **12**). Moreover, if vacant areas exist in a plurality of server areas **41**, **153**A, the controller **17** determines the moving destination of the print data according to a set priority order.

If there is no vacant area in both server areas **41** and **153**A (NO in ACT **11**), the controller **17** deletes the print data in the server areas **41**, **153**A serving as the moving destination as much as the capacity of the print data to be moved (the print data which are nor printed even the given period has passed) to guarantee a storage area for storing the print data to be moved (ACT **13**).

The priority order of the data to be deleted is set in advance. For example, in the two server areas **41**, **153**A, the controller **17** takes the one that includes the oldest print data in all the print data in the server areas **41**, **153**A as the deleting target. Then the controller **17** deletes the print data as much as the capacity of the print data which are not printed even the given period has passed in an order from the oldest print data then to the second oldest print data in the server areas **41**, **153**A.

Further, for example, in the two server areas **41** and **153**A, the controller **17** may also take the one that includes the least important print data in all the print data in the server areas **41**, **153**A as the deleting target. Then the controller **17** deletes the print data as much as the capacity of the print data to be moved in an order from the least important print data then to the second least important print data in the server areas **41**, **153**A. If the least important print data exist in both of the server areas **41** and **153**A, the controller **17** determines the server area **41** or the server area **153**A to be the deleting target according to the setting of the priority order. And it is the same if a plurality of least important print data exist in the server area **41** or **153**A serving as the deleting target.

The controller **17** associates the information representing that the print data is moved out from the print data area **152** and a user name with the print data, and moves the print data to other server areas **41**, **153**A (ACT **14**).

Next, a processing in a case where there are print data moved to other server areas **41**, **153**A when a user logs in the image forming apparatus **1** is described with reference to a flowchart in FIG. **3**. FIG. **4** is a diagram illustrating a confirmation screen **91** (a third screen).

The controller **17** carries out a login authentication of a user (ACT **20**).

If the logging in of the user is approved (YES in ACT **21**), and if there are print data moved to other server areas **41**, **153**A, that is, the print data associated with the user (YES in ACT **22**), the controller **17** displays the confirmation screen **91** on the control panel **14** (ACT **23**).

The controller **17** displays a message **911** for asking whether or not to display the print data which are not printed even the given period has passed, an OK button **912** and a cancel button **913** on the confirmation screen **91**.

If an input of the OK button **912** (a list displaying instruction) is received (YES in ACT **24**), the controller **17** displays the management screen **92** on the control panel **14** (ACT **25**).

FIG. **5** is a diagram illustrating the management screen **92** (a first screen, a second screen, a fourth screen and a fifth screen).

The controller **17** displays a print data list **921** in which the print data moved to other server areas **41**, **153**A are sorted based on the level of importance, a cancel button **922**, a delete button **923** and a print button **924** in the management screen **92**. In FIG. **5**, in the print data list **921**, the controller **17** displays the most important print data on the top of the screen; however, it is not limited to this, the controller **17** may also display the least important print data on the top of the screen. Further, the controller **17** displays the level of importance of

the print data in association with file names, and displays the print data (level of importance and file name) in a selectable manner.

If a selection of print data and an input of the delete button **923** (deleting instruction) are received (ACT **26**: delete), the controller **17** deletes the selected print data in other server areas **41**, **153**A (ACT **27**).

If a selection of print data and an input of the print button **924** (printing instruction) are received (ACT **26**: print), the controller **17** acquires the selected print data from other server areas **41**, **153**A and deletes the print data from other server areas **41**, **153**A (ACT **28**). Then the controller **17** carries out a printing operation based on the selected print data (ACT **29**).

If there is no print data associated with the user in other server areas **41**, **153**A (NO in ACT **22**), or if the inputs of the cancel buttons **913**, **922** in the confirmation screen **91** and the management screen **92** are received (NO in ACT **24**, or ACT **26**: cancel), or after the print data moved to other server areas **41**, **153**A are deleted (ACT **27**), or after the printing operation is ended (ACT **29**), the controller **17** enables the image forming apparatus **1** to be in a standby state.

Further, dedicated print server areas may also be arranged in the server areas **153**, **153**A and **41** for storing print data. Then the image forming apparatus **1** may also move the print data to the print server area in the server areas **41**, **153**A of other apparatuses **4**, **1**A.

The order of each processing in the embodiment stated above is not limited to this; it may also be different from that exemplified in the embodiment stated above.

As stated above, according to the technology in the present invention, a storage technology of print data can be provided.

While certain embodiments have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of the invention. Indeed, the novel embodiments described herein may be embodied in a variety of other forms; furthermore, various omissions, substitutions and changes in the form of the embodiments described herein may be made without departing from the spirit of the invention. The accompanying claims and their equivalents are intended to cover such forms or modifications as would fall within the scope and spirit of the invention.

What is claimed is:

1. An image forming apparatus, comprising:

a communication section configured to receive print data;

a storage section configured to store print data in a print data area;

an operation section configured to receive an operation input;

an image forming section configured to form an image on a sheet based on the print data if the operation section receives a printing instruction of print data; and

a controller configured to move print data which are not printed even a given period has passed since the print data is received by the communication section from the print data area to other storage area, wherein:

the controller displays, if a user is approved, and if there are print data moved to other storage area, a third screen for receiving a list displaying instruction of the print data moved to other storage area on a display, and displays, if a list displaying instruction is received, a fourth screen for displaying a list of the print data moved to other storage area on the display, and

wherein information representing the level of importance is associated with print data;

the controller sorts and displays, if a list displaying instruction is received, the print data moved to other storage area based on the level of importance in a selectable manner, and displays the fourth screen for receiving a deleting instruction of the selected print data and a printing instruction on the display;

deletes, if a selection of print data and a deleting instruction is received, the selected print data from other storage area; and

acquires, if a selection of print data and a printing instruction is received, the selected print data from other storage area to print the selected print data, and then deletes the selected print data from other storage area.

2. The apparatus according to claim **1**, wherein:

other image forming apparatus is connected with the image forming apparatus to be capable of carrying out data communication; and

the controller moves print data to a storage area of other image forming apparatus.

3. The apparatus according to claim **1**, wherein:

the controller moves the information representing that print data is moved from the print data area to other storage area in association with the print data.

4. The apparatus according to claim **1**, wherein:

the controller carries out a user authentication, displays, if a user is approved, print data moved to other storage area in a selectable manner and a first screen for receiving a printing instruction of the selected print data on a display, acquires, if a selection of print data and a printing instruction is received, the selected print data from other storage area to print the selected print data, and then deletes the selected print data from other storage area.

5. The apparatus according to claim **1**, wherein:

the controller displays, if a user is approved, print data moved to other storage area in a selectable manner and a second screen for receiving a deleting instruction of the selected print data on a display, and deletes, if a selection of print data and a deleting instruction is received, the selected print data from other storage area.

6. A storage method of print data based on an image forming apparatus provided with a storage section for storing print data in print data area and an operation section for receiving an operation input, including:

receiving print data;

forming an image on a sheet based on the print data if the operation section receives a printing instruction of print data;

moving the print data which are not printed even a given period has passed since the print data is received from the print data area to other storage area;

displaying, if a user is approved, and if there are print data moved to other storage area, a third screen for receiving a list displaying instruction of the print data moved to other storage area on a display, and displaying, if a list displaying instruction is received, a fourth screen for displaying a list of the print data moved to other storage area on the display, wherein information representing the level of importance is associated with print data;

sorting and displaying, if a list displaying instruction is received, the print data moved to other storage area based on the level of importance in a selectable manner, and displaying the fourth screen for receiving a deleting instruction of the selected print data and a printing instruction on the display;

deleting, if a selection of print data and a deleting instruction is received, the selected print data from other storage area; and

acquiring, if a selection of print data and a printing instruction is received, the selected print data from other stor-

age area to print the selected print data, and then deleting the selected print data from other storage area.

7. The method according to claim **6**, wherein:

the image forming apparatus is connected with other image forming apparatus to be capable of carrying out data communication; and

print data are moved to a storage area of other image forming apparatus.

* * * * *